IN THE DRAWINGS:

Applicants have amended Figure 9 to include the legend "Prior Art." Drawing sheets in compliance with 37 CFR 1.121(d) accompany this Amendment.

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REMARKS

Claims 1-10, as amended, remain herein.

1. Figure 9 has been amended to designate it as prior art.

2. The Office Action objected to the specification for the use of the symbol "~" in equations 25, 27, 30, 32, 33, 38, and 39. These equations have the form "DAT[1]~DAT[12]." The symbol "~" is a well known mathematical symbol that means "is similar to," or "same order of magnitude as." Thus the equation DAT[1]~DAT[12] identified in the Office Action means DAT[1] "is similar to or of the same order of magnitude as" DAT[12]. Attached hereto is a copy of the definition of the mathematical symbol "~" from Weisstein, Eric, CRC Concise Encyclopedia of Mathematics, CRC Press, Boca Raton, 1999, page 1634. Applicants therefore respectfully request reconsideration and withdrawal of this objection.

Applicants have edited the specification to correct the term "non-operational," thereby mooting this objection to the specification.

3. Applicants have amended the claims mooting the objections thereto.

4. Claims 1-10 were rejected under 35 U.S.C. §112, first paragraph. A predetermined threshold value can be experimentally determined to prevent an adverse effect of a vibration caused by a disc of large mass eccentricity. Please see the specification at page 1, lines 24-28. Applicants respectfully request reconsideration and withdrawal of this rejection.

5. Claims 1-10 were rejected under 35 U.S.C. §112, second paragraph. Applicants have deleted the use of "..." throughout all the claims. Applicants have amended claims 1, 2, 6, and 7 to recite the angular division of a rotation. Applicants have amended claims 1, 2 and 6-10 to clarify the comparison of the vibration detection value to the predetermined threshold value. Applicants have amended claims 3-5 and 8-10 to clarify the difference of counted values. Reconsideration and withdrawal of these rejections, and allowance of all claims 1-10 are respectfully requested.

6. Claims 3-5 and 8-10 were rejected under 35 U.S.C. §112, second paragraph, for the recitation of equations having the symbol "~." As noted above, the symbol "~" is a mathematical symbol that means "is similar to" or "same order of magnitude as." Thus the equation DAT[1]~DAT[m] identified in the Office Action means DAT[1] that is similar to or the same magnitude as DAT[m]. Applicants therefore respectfully request reconsideration and withdrawal of this rejection.

Accordingly, this application is now fully in condition for allowance, and a notice to that effect is respectfully requested. The Commissioner is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293 (Order No. 28951.5338). If further amendments would place this application in even better condition for issue, the Examiner is invited to call applicant's undersigned attorney at the number listed below.

Respectfully submitted,

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Date: May 12, 2006

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Silverman's Sequence

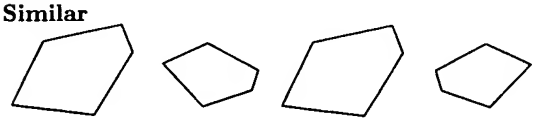
Let $f(1) = 1$, and let $f(n)$ be the number of occurrences of n in a nondecreasing sequence of INTEGERS. Then the first few values of $f(n)$ are 1, 2, 2, 3, 3, 4, 4, 4, 5, 5, 5, ... (Sloane's A001462). The asymptotic value of the nth term is $\phi^{2-\phi} n^{\phi-1}$, where ϕ is the GOLDEN RATIO.

References

Guy, R. K. "Silverman's Sequences." §E25 in *Unsolved Problems in Number Theory, 2nd ed.* New York: Springer-Verlag, pp. 225–226, 1994.

Sloane, N. J. A. Sequence A001462/M0257 in "An On-Line Version of the Encyclopedia of Integer Sequences."

Similar



directly similar *inversely similar*

Two figures are said to be similar when all corresponding ANGLES are equal. Two figures are DIRECTLY SIMILAR when all corresponding ANGLES are equal and described in the same rotational sense. This relationship is written $A \sim B$. (The symbol $\sim$ is also used to mean "is the same order of magnitude as" and "is ASYMPTOTIC to.") Two figures are INVERSELY SIMILAR when all corresponding ANGLES are equal and described in the opposite rotational sense.

see also DIRECTLY SIMILAR, INVERSELY SIMILAR, SIMILARITY TRANSFORMATION

References

Project Mathematics! *Similarity.* Videotape (27 minutes). California Institute of Technology. Available from the Math. Assoc. Amer.

Similarity Axis

see D'ALEMBERT'S THEOREM

Similarity Dimension

To multiply the size of a d-D object by a factor a, $c \equiv a^d$ copies are required, and the quantity

$$d = \frac{\ln c}{\ln a}$$

is called the similarity dimension.

Similarity Point

External (or positive) and internal (or negative) similarity points of two CIRCLES with centers C and C' and RADII r and r' are the points E and I on the lines CC' such that

$$\frac{CE}{C'E} = \frac{r}{r'},$$

or

$$\frac{CI}{C'I} = -\frac{r}{r'}.$$

Similarity Transformation

An ANGLE-preserving transformation. A similarity transformation has a transformation MATRIX A' of the form

$$\mathsf{A}' \equiv \mathsf{BAB}^{-1}.$$

If A is an ANTISYMMETRIC MATRIX ($a_{ij} = -a_{ji}$) and B is an ORTHOGONAL MATRIX, then

$$(bab^{-1})_{ij} = b_{ik}a_{kl}b^{-1}_{lj} = -b_{ik}a_{lk}b^{-1}_{lj} = -b^{\dagger}{}_{ki}a_{lk}(b^{\dagger})^{-1}{}_{jl}$$
$$= -b^{-1}{}_{ki}a_{ki}b_{jl} = b_{jl}a_{lk}b^{-1}_{ki} = -(bab^{-1})_{ji}.$$

Similarity transformations and the concept of SELF-SIMILARITY are important foundations of FRACTALS and ITERATED FUNCTION SYSTEMS.

see also CONFORMAL TRANSFORMATION

References

Lauwerier, H. *Fractals: Endlessly Repeated Geometric Figures.* Princeton, NJ: Princeton University Press, pp. 83–103, 1991.

Similitude Center

Also called a SELF-HOMOLOGOUS POINT. If two SIMILAR figures lie in the plane but do not have parallel sides (they are not HOMOTHETIC), there exists a center of similitude which occupies the same homologous position with respect to the two figures. The LOCUS of similitude centers of two nonconcentric circles is another circle having the line joining the two homothetic centers as its DIAMETER.

There are a number of interesting theorems regarding three CIRCLES (Johnson 1929, pp. 151–152).

1. The external similitude centers of three circles are COLLINEAR.
2. Any two internal similitude centers are COLLINEAR with the third external one.
3. If the center of each circle is connected with the internal similitude center of the other three [sic], the connectors are CONCURRENT.
4. If one center is connected with the internal similitude center of the other two, the others with the corresponding external centers, the connectors are CONCURRENT.

References

Johnson, R. A. *Modern Geometry: An Elementary Treatise on the Geometry of the Triangle and the Circle.* Boston, MA: Houghton Mifflin, pp. 19–27 and 151–153, 1929.

Similitude Ratio

Two figures are HOMOTHETIC if they are related by a DILATION (a dilation is also known as a HOMOTHECY). This means that the connectors of corresponding points are CONCURRENT at a point which divides each connector in the same ratio k, known as the similitude ratio.

see also CONCURRENT, DILATION, HOMOTHECY, HOMOTHETIC

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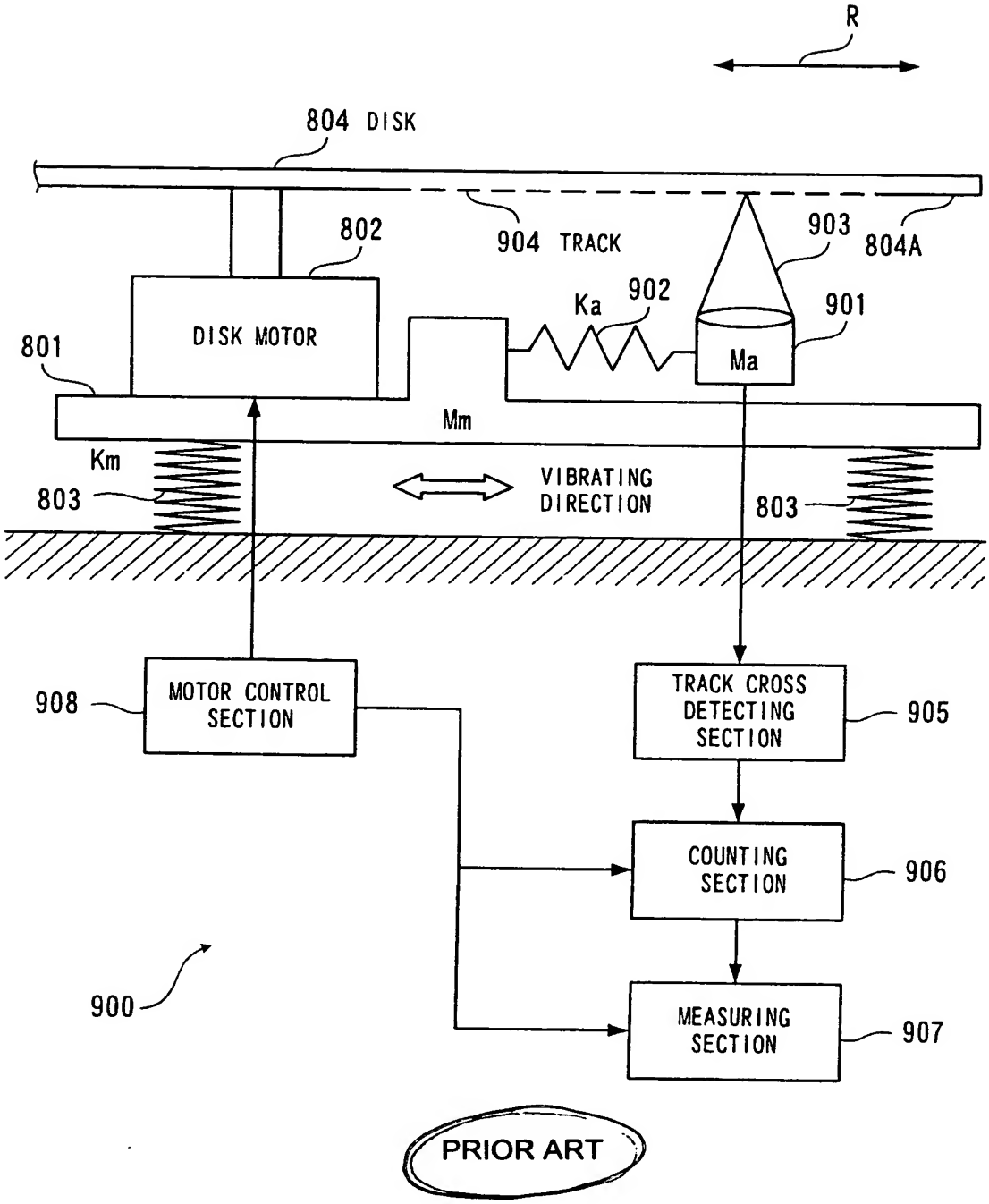
Annotated Sheet

FIG. 9



PRIOR ART

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